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R. W. SPERRY and J. LEVY, Division of Biology, California Institute of Technology. Hemispheric specialization as reflected in the syndrome of the neocortical commissures.

Commissurotomy patients of P. Vogel and J. Bogen with complete surgical division of corpus callosum and anterior commissure show numerous functional deficits in controlled performances that involve cross-integration between basic sensory, motor and linguistic activities normally mediated between the two hemispheres. By contrast none of these basic impairments in cross-integration were evident in a patient with total agenesis of the corpus callosum studied by Saul and Sperry with the exact same battery of tests. Functional compensation in the agenesis patient remains unsuccessful, however, for more complex perceptual and cognitive performances that involve faculties directly related to cerebral dominance and lateral specialization of function. This same syndrome appears also in more exaggerated form in the commissurotomy patients in unrestricted testing conditions. The commissurotomy patients as a group are severely impaired in their performances on spatially oriented and perceptuomotor tasks, in block design tests, in drawing, mathematics and geometry and in non-verbal as opposed to verbal reasoning. The findings suggest that the neocortical commissures are crucial for better-than-mediocre performance in activities that draw on mental faculties that normally are specialties of the minor hemisphere.